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NATURAL SCIENCE AS A FACTOR IN EDUCATION.*

By THOMAS R. BACON.

It is with great pleasure that I come hither to bring from the University of California a greeting to her little sister, a sister not yet fully grown, but giving sure promise of great comeliness and great usefulness in the coming years. We of the University of California have reason to think highly of Pomona College. "By their fruits ye shall know them." We have had at the University many students who have received a part or the whole of their undergraduate training at Pomona College. No class of students that we have shows better training, more well-guided intelligence, greater moral earnestness than this. We have been in a position to apply to this institution the only test which ought to be applied in judging of the value of an educational establishment, and Pomona has not been found wanting. I can therefore bring to you heartiest greeting and encouragement as to those who are doing good work, and who will succeed because they deserve to.

The type of college which has been founded here, and which has so soon found its way to recognition, is not difficult to identify. It is one of those institutions for

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higher education with which Congregationalists have dotted the land across its breadth and through its length. Personally I do not care about denominations. I resent the common doctrine that it is a good thing to have the body of Christ torn in pieces. The Roman soldiers who crucified Jesus had the grace to cast lots for his seamless vesture; his avowed followers have rent it into many rags. This condition of things is to be accounted for by the fact that those who are called to be saints are not yet fully sanctified, but in that fact I see no special cause for thanksgiving. The scandal of denominationalism, however, has in it some alleviating features, due not to the wisdom or virtue of man, but to the providence of God, who maketh the wrath of man to praise him. One of these features is that each denomination is apt to find some kind of work for which it is especially fitted, and, if it is faithful to its calling, it will put a large part of its energy and resources into that work. Congregationalism, which started out not to be a sect, but which, by throwing overboard some of its first principles, has succeeded in becoming one, has seemed to be called to the work of founding and nurturing colleges. It began this work, almost as soon as it began to find a footing on this continent, in the founding of Harvard College, and it has kept it up ever since. We find among its latest fruits this institution. I do not in the least wish to depreciate the services rendered to higher education by other denominations. I only wish to point out that this rather small denomination has had conspicuous success in this work, and that this success has been won mainly because of a very simple sort of wisdom, the wisdom of sincerity. It has been a common characteristic of these institutions that they have not tried to do more than they were fairly capable of doing; they have preferred to do a few things well rather than to do many things superficially; they have been careful to cut their garments according to the cloth and so have been sufficiently clothed; they have not pretended to give that which they had not,

and what they have given has been good. Under this policy, liberally administered, some have long since outgrown all denominational limitations. Some have developed into great universities; because they were faithful in a few things, they have been made rulers over many things. Some have been content to remain simple colleges, and have done no less honorable and useful work because circumstances have forbidden their development in this particular direction. It is not their habit to profess more than they practice, nor to call themselves universities, as the manner of some is, when they have barely emerged from the high school stage. Think how lately it is that the two oldest of these colleges, Harvard and Yale, assumed the larger title, and helped to redeem it from the disrepute into which it had fallen in the land through its abuse.

To the company of colleges thus founded and thus nurtured Pomona is one of the latest additions, and the common characteristic which I have noticed is present here. To do a little work well, and so to earn the opportunity of doing greater works, is the only sound principle for a college whose beginnings are humble and full of struggle. Because Pomona has been doing thus in the day of small things, therefore are opening to her the larger opportunities of which the dedication of this new building is an outward and visible sign. If this spirit shall continue to inform the college, peace and prosperity shall be within her walls.

When your President requested me to wire to him the subject of my address for to-day, I was sorely put to it how to answer. I dislike to announce the subject of an address before I have written it. I prefer to make the address and then give it a name. I admire those who know to-day exactly what they want to say to-morrow, but I am not one of them. This may argue a vacillating mind, an uncertain intelligence. But I have no apology to offer, only an explanation. I was born so, and my early training was insufficient to overcome this innate characteristic.

The President's request was imperative, almost a command. Something had to be done; so I sent him the title which is printed on the program—"Natural Science as a Factor in Education." I chose this title for two reasons. First; I have peculiar qualifications for dealing with it. As I know very little about the natural sciences and nothing whatever about pedagogy, I can approach the topic with equal and unprejudiced mind. Second; it is a large and roomy topic, inside of which you can make almost any sort of remark, without transcending the limits of the subject. I have always had much sympathy for the clergyman who said he preferred to take a whole chapter as a text for a sermon, so that, when he was persecuted in one verse, he could flee into another.

Let us now turn from these introductory remarks, to a brief and somewhat casual consideration of the subject announced.

By the word "education," used in the title, I mean what used to be called liberal education, what we now describe by the less happy phrase, "general culture." This exclusion of technical, professional, or specialized studies from the consideration is not because these studies are not education in the truest sense, but because the relation of the natural sciences to such studies is perfectly obvious. We do not need to discuss at length why a student who proposes to follow electrical engineering should study physics, or why one who is going to be a physician should study biology, or why one who is going to devote his life to the investigation and teaching of geology should acquire at least some small knowledge of that science. It is at once evident that for any of these pursuits acquaintance with certain branches of physical science is absolutely prerequisite. It is quite another matter to determine the value of such studies for those who have no expectation of ever putting them to what we call practical use.

That the study of some branch or branches of physical science is valuable in a liberal education is now universally

admitted. The progress of these studies in the curricula of the higher institutions of learning has been somewhat slow, and in some of the greatest universities of the world they do not yet hold so distinguished a place as they deserve. But even the most conservative of intelligent and learned men now admit that these sciences are of a certain value as a means of general culture, that their pursuit, even for a brief time, helps to furnish and expand the mind, and to fit it for better work in any department of knowledge and activity. The assent has been slow and reluctant, but it is now complete, and in most colleges, where there are any limitations whatever upon the choice of studies, the student is obliged to study at least one of the natural sciences as a prerequisite to a degree.

Some years ago I was an undergraduate in a venerable and conservative college, whose curriculum was almost wholly prescribed. Among the prescriptions were certain branches of physical science; chemistry, physics, astronomy, botany, perhaps others, whose very names I have forgotten. Thus there was, even at that distant time, a real recognition of the fact that some such study was important to the education of a gentleman. But the recognition was a slight one, merely formal. The methods of instruction were so insufficient that any high school of today would be disgraced by them. I think that we devoted six whole weeks to the science of chemistry. We studied a little book, which no one took the trouble to make us understand, and a gentleman stood up before us and performed some experiments which excited our wonder and admiration. In physics it was much the same. Our text book (which was called "Natural Philosophy") was administered to us by a tutor, who, I believe, was a good Greek scholar, but whose qualification for teaching physics consisted in the fact that he had himself gone over the same book some years before. I think the course was more depressing to the teacher than to the taught, for he took the matter seriously, and we took it somewhat sportively. At any rate, we never got anywhere.

We soon met obstacles which were insurmountable, and spent the rest of the term in reviewing. The experimental part of our instruction was conducted by an eminent man, who did the work himself, and whose eccentric personality lent a rare interest to the lectures. The attempt of the lecturer to give us an insight into the principles of physics was met by an amiable appreciation of his good intentions on the part of the class, and an enthusiastic interest in the dramatic success of his experiments. This interest culminated in the experiments with the air gun. Long tradition told from class to class of his marvellous skill with this weapon, and two annual shots at a target maintained his reputation as an accurate marksman. When in due time my class saw him raise the gun to his shoulder and run his glance along the sights, the interest was breathless. When the missile pierced the bull's eye, enthusiastic applause rang from every part of the room. Again the gun popped, but no new mark marred the fair face of the target, and there was a silence that could be heard for a moment, until the demonstrator turned to us and said in tones which none who heard can ever forget, "It went through the same hole." This incident was, I believe, the most permanent impression made upon my class by the study of physics. It did not teach us anything about the laws of physics, but it taught us that the professor was a good shot—a thing which it might be useful to know. About our instruction in botany, I remember nothing, except that half the class used to climb out of the window after they had been marked present, and that on one occasion, the professor brought in various kinds of fruit, and, when he had finished talking about it, he handed it around among the audience. Perhaps you are now prepared to believe that I know very little about natural science. What little I do know, I certainly did not learn in college. I do not think that this was because I was an exceptionally stupid or uninterested student. With the exception of a few, whose interest in these subjects was innate and

invincible, I do not think that the rest of the class got more than I did. Neither was this condition of things due to the fact that all our instructors were inadequate. Among them were men of highest eminence in their departments. The trouble was that the recognition of the value of the natural sciences as a factor in culture was still so grudgingly given that no adequate provision was made for their teaching; neither such time, nor room, nor apparatus as were fit and necessary. In other institutions it was much the same, at the time of which I speak; in some a little better; in others, if possible, worse. Do not mistake me. At that time there was the fullest recognition of the importance of physical sciences as a part of professional training. In the institution of which I speak, there was as ample provision for such studies for such purposes as the times and the resources of the institution allowed. It was acknowledged also, as we have seen, that they ought to form a part of a liberal education; but the acknowledgement was so reluctant and inadequate, that the sciences as culture studies were still almost valueless.

This is all changed now. Even the most conservative institutions of general culture now give amplest opportunities for such studies, and encourage, if they do not require, their students to pursue them in a thorough and efficient way. Time, room, and apparatus are at their disposal, and every student is instructed in at least one natural science, as if he had to depend upon it for making a living. Natural science has at last taken its proper place and has received full recognition as an important element in liberal culture, beside languages, literature, and mathematics.

It is always difficult to draw the line between liberal and technical studies, at least in practice. Theoretically there is little or no difficulty. Culture studies are those which are pursued simply for the sake of developing the mind, without reference to their practical and immediate application to the business of life. Technical studies are those which are pursued with special and immediate reference to

their application to a man's profession and business. It was not without reason that the classic languages so long held their place as the supreme means of culture. Their very aloofness from our own life, their opening up to us of the antique world, so remote from us with its splendid thought and life that it could be turned to no sordid and vulgar use, their bringing us into acquaintance with men and women removed from our self-interest, with whom we could not buy nor sell, of whom we could not take advantage, and who jostled us with no hurry of business and vexed us with no emulations, these made the ancient literatures of Greece and Rome the almost exclusive means of culture; these things make them still the most important among the many factors which may now enter into an education, which may be truly liberal, even without the classics. But their remoteness from our daily life has not made it impossible to use them for purely technical ends. To the person who studies Greek and Latin simply to fit himself to teach these subjects, they are as really technical studies as are anatomy for the doctor or chemistry for the miner. For it is not the subject matter of a study which determines its character; it is the aim with which it is pursued. All studies may be liberal, if they are followed in a liberal spirit, but it does not follow that all studies are of equal value as means of culture.

An eminent man once put forth the proposition that one study is as good as another. I do not know whether he invented this doctrine; but, after he uttered it, it was taken up and repeated by a great many foolish persons. I believe that the eminent man referred to did not propound this thesis as a statement of his conviction, but for the purpose of exciting discussion. It is a way he has. If this is so, his purpose was fulfilled. No sane man accepts this doctrine, but its enunciation has led to careful consideration and intelligent discussion of the comparative educational values of different studies, not only on the part of educators, but on the part of all who have children to

educate, or who are children to be educated. To one very small part of this great discussion this paper is a humble contribution.

One reason why the study of physical science has a high educational value is that it teaches us to think. It teaches us to observe patiently, to reason accurately, to conclude justly. It is not the only study which teaches us to think, but it gives us the best possible training in one most important kind of thinking. There are commonly said to be two kinds of reasoning; two methods of thought, which are called deductive and inductive. These two methods are perfectly distinguishable by the mind and they are in constant and daily use by every man. The most familiar illustration of the deductive method is found in the science of pure mathematics. The mind looks into itself and finds there certain things which it knows; axioms, as we call them; such as the certainty that one is not two, that the whole is greater than a part, that two things which are equal to the same thing are equal to each other. The notes of an axiom are that no reasoning can shake belief in it, and no demonstration can add one iota to its certainty. Starting from these data, the mind, following the necessary laws of its own action, the laws of deductive logic, reaches conclusions of which it is absolutely sure. We know no greater certainty, we are accustomed to say, than a proposition which is mathematically demonstrable. The validity of this method of reasoning is never disputed, although it is sometimes overlooked by persons who ignorantly prate about the scientific method. What we call the inductive method of reasoning is altogether different. The mind observes certain phenomena, and attempts to find the law in accordance with which they exist; or, as we commonly but mistakenly say, tries to account for them. It makes a guess at this law, and then tries to find out whether this guess is true by further experiment. A guess thus formed is at first only a possibility; experiments may show its error or may lift it

to the dignity of a probability; yet further attempts at verification may reduce the possibility of error to a negligible quantity, and then what was once a mere guess is established as an ascertained natural law. This is, in the main, the method of natural science. I have tried to describe the two methods in popular rather than technical language, and my attempt to thus make the matter clear has probably resulted in simple confusion.

With the deductive method we have at present nothing to do, although it enters into scientific thinking far more than is commonly suspected or admitted. As I have said, both methods are used every day by every one, although most persons would be as much surprised to discover it as was M. Jourdain to discover that he had been talking prose all his life. But we do not use them properly, or follow them consistently. One of the great objects of intellectual education is to teach men to reason accurately by both these methods, which they must use in daily life. Macaulay was at pains to point out, in his essay on Bacon, that the method of modern science was simply that which men had been accustomed to use from the beginning in connection with the most trivial affairs. You remember his famous illustration of the man and the mince pies. I use it because it is familiar and because its illusive character has been so often pointed out. The man eats mince pie on Monday and lies awake Monday night through indigestion. Tuesday, no mince pie, no insomnia. Wednesday, mince pie and more trouble; and so on through the whole week. By the time Sunday comes, he reaches, by the inductive method, the conclusion that mince pie does not agree with him. This is the scientific method. Macaulay was often carried away by the desire of saying a brilliant thing, and never more so than in this illustration. A more complete travesty upon the method of inductive science could hardly be invented, or a better illustration of what science is not. This man of the pies reasons from insufficient data. That under certain circumstances, in one particular state of his

health, under certain atmospheric conditions, he has been ill after eating the pie, does not prove that mince pies do not agree with him. Moreover, there is notoriously no matter upon which personal prejudice is so likely to influence conclusions as matters of diet. After a roystering supper, a man is always sure the next morning that it is not what he has drunk but what he has eaten that makes him feel so queer. In this case, the man probably likes or dislikes mince pies; it is hardly probable that he can assume toward them that cool, impartial attitude which is the mark of the scientific temper. Furthermore, he has not made a careful study of the other articles of his diet on these several days, so as to establish, by a process of exclusion, the fact that nothing else could have wrought havoc with his digestion, except mince pies. Again, he has not analyzed the particular pies which he has eaten, nor has he established by a series of experiments the fact that mince pies are generically unsuited to his digestion. If his experiments have any significance at all, they prove no more than that pie compounded in one particular fashion, a particular brand of pie, "like mother used to make," does not agree with him. To infer from this conclusion the broad generalization that mince pies as such do not agree with him is to take a leap so broad that any system of logic stands aghast. It is to be remarked further that this man of the pies must be possessed of a scientific spirit far beyond what our acquaintance with him and our experience of human nature have led us to suspect, if he does not broaden his generalization still further and declare that he knows from experience, and by the inductive method of reasoning, that mince pies are generically unwholesome, and does not organize a crusade against such pies as the root of all evil, physical and moral.

Macaulay's pie theory is a very simple illustration of the origin of all quackeries. The method pursued by the man who has suffered from too much pie is undoubtedly inductive, but it is illustrative of the fact that induction

may be just as grossly abused as deduction. I do not wish to be accused of plagiarism, so will mention that I have heard some such strictures before on the man and the pies. I read something of the kind twenty or thirty years ago, but as I have been unable to discover the passage, I do not feel justified in using quotation marks.

This sort of induction has been the parent of the most part of human error since the world began. It is the source of humbug, crankeries, vaticinations, weather prophesies, false religions, heresies, schisms, and all folly and uncleanness. Not the least important mission of modern science has been to correct such inductive reasoning, and to make it really reasonable. There is no time now to point out the principles of inductive logic by which it eliminates error to the vanishing point, nor do I think myself competent to do so. But you have got to learn these principles if you are going to think straight about half the interests of man and men. You may learn something about these principles, if you will thoughtfully read that part of Mill's *Logic* (for instance) which deals with induction; but you will learn a great deal more about them if you take a course in physics, and carefully note the method by which that science reaches its certain conclusions. No one of the natural sciences better illustrates the method, and better teaches us the necessity of patient and careful observation in the collection of data, of trusting just enough and no more to "working hypotheses," of verifying these hypotheses with diligence and humility, and no other of these sciences bids so fair to take up and correlate with itself all the branches of physical knowledge.

A second reason why the study of natural science is an important factor in liberal culture is that any man, however highly educated, is half out of touch with the life and thought of the modern world unless he is familiar with this way of thinking. To be in touch with this side of modern thought, it is not necessary to be an expert in any single line. A man may know as little as I did, when I

escaped from college, of any branch of science, but if he knows *how* scientific men reach their conclusions, he knows enough to put him in sympathy with the characteristic feature of modern life. And a man, who does not know so much, is going to be left behind. He is a laggard in the march of the race; for him is no part in the glory which shall be, when all things, all the forces of the physical universe, are put under the foot of man.

In the third place; now I come to the conclusion of the whole matter, and to the only serious excuse which I can offer for speaking on this subject on this occasion. Scientific thought leads us to a knowledge of the thoughts and purposes of God. God does not reason deductively or inductively. As that "Mohammedan blackguard," Omar Khayyam, perceived a thousand years ago, God does not reason;

"*He knows*, HE KNOWS, HE KNOWS!"

But both the deductive and inductive method of reasoning lead us to an approximate knowledge of the thought which is his being. There is no reality but what God thinks, and man has no worth or being except as he is a part of God's thought. The universe, physical, moral, spiritual, is only God's thought, and subsists only as he thinks it. Suppose that he ceased to think it, or to think of it. Suppose, that like man, his imperfect image, he could forget; suppose that one sparrow could fall to the ground without your Heavenly Father's notice; suppose the registered number of one of your hairs could be forgotten by him; suppose he could forget or cease to think: in such case there shall be nothingness; in the place of this fair universe, an unthinkable void;

Nor sun, nor star shall waken,
Nor any change of light;
Nor sound of waters shaken,
Nor any sound or sight;
Nor wintry leaves nor vernal,
Nor days nor things diurnal;
Only a sleep eternal
In an eternal night.

God has thoughts; therefore we are; therefore all things exist. If he stopped thinking, nothing could be. There would be a blank. Do you ask how I know this? The question is pertinent. I can reach this conclusion by a process as sure as that by which we reach the conclusions of mathematics. There are other axioms in the human mind than those which lay the basis of mathematical science, and one of these axioms is, that right is not wrong and wrong is not right. This axiom carries with it the existence of God, and his absolute supremacy over all things and all beings. The deductive sciences; mathematics, which is only illustrative of the Creator's eternal way of thinking; philosophy, which starts from the same point as mathematics, and which reaches conclusions which seem less certain than those of mathematics only because they are less easy to verify in practice; theology, which is perhaps the most certain of the three, because it finds its verification not in the erring intelligence of man, but in his permanent, his eternal, emotions; all these sciences declare the existence and sovereignty of God.

The mission of the inductive sciences is somewhat different. They do not pretend to deal with final causes. They do not pretend to question the existence of God, or whether there be a God at all. Such questions are altogether outside their sphere. They deal, and they profess to deal, only with secondary causes. Yet no man, who is liberally educated and who understands the method of physical science, can fail to discover that there is much to learn of God from the nature of his operations in the material universe. It is much indeed to learn that the Creator of the ends of the earth fainteth not neither is weary, that he has not left the works of his hands to take care of themselves, but that his eternal life throbs through the secret veins of all this vast body of worlds and suns which are, and came to be, through his creative *fiat*.

The great generalizations of science mean something, otherwise they are not worth while. Such principles as the

law of gravitation, the conservation of energy, the struggle for existence, with its corollary of the survival of the fittest, the law of continuity, have an higher interpretation than they have yet received from the mind of man. They are all illustrations not of what God thinks, but of how he thinks. Because we know that right and wrong are different, we know that God thinks right. How far his right thinking can be known to man is largely dependent upon those who have learned to think precisely and correctly in the two only methods which are open to man. Those who know how to think correctly only in one way are not going to help mankind with any vivid consciousness of the fact. They may be helpful but they will not get the joy of helpfulness. There are few lives that have recently been more helpful to mankind than that of Charles Darwin; but no one can read his biography without feeling that he missed a half, perhaps the better half, of life. Absorbed in scientific pursuits, his interest failed in the other half of human life; poetry, romance, religion, faith. We know that his devotion to human good won its reward, although there was denied to him here the supreme earthly good, the faith whereby we live.

Neither the specialist in deduction nor the specialist in induction is going to work out our salvation. It is the man who is broadly educated, who has had thorough training in all possible methods of thought, who is going to do all that thought can do for the help of man. For such a man has a close hold on God, WHO KNOWS.

I am speaking to you all, but I have a special word for the students of Pomona College. More lies behind you than the brief tradition of this ten-year-old school. Behind you lie all the best traditions of culture. What the classic ages wrought out for man in the beauty of Greek culture and the strength of Roman law; what the coming of Christianity wrought in the elevation of moral standards and the inspiration of a nobler spiritual life; what the latest centuries have wrought in welding together into one

vast and beneficent influence the great gifts of the past, in unlocking the secrets of the material universe and bringing them to the use of man; what the race has learned in all the strange vicissitudes of its history; all these things are yours, here, in this little college at the very ends of the earth. The accumulated waters of the showers of heaven that have fallen through the ages have broken forth here in a perennial spring from which you may drink and live. Your opportunity is great, for this is the water of life, the sacramental cup. Whoso worthily drinketh thereof, shall thirst no more; but whoso drinketh unworthily drinketh damnation to himself. For this sacrament is truly received only by the faith of him who taketh it.

ELEMENTARY STUDIES IN LITERATURE FOR ADULT CLASSES.

By CORNELIUS BEACH BRADLEY.

II. HOW POETRY DEALS WITH EXTERNAL NATURE.

LESSON I. INTRODUCTORY.—Taking Milton's *L'Allegro* as one of the earliest examples of the poetic treatment of nature within the scope of our study, we shall find that the poem, as a whole, sets before us a certain temperament, or mood of mind, which we may roughly characterize as the lively or mirthful mood. The structure of the poem is as follows:—First, a mythological frame or setting represents the poet as a votary applying for initiation into the mysteries and the goodly fellowship of mirth. The antagonistic mood of sullenness, with all its associations and works, is renounced and banished. The mood of mirth is invoked—personified as the tutelary divinity,—with suggestion of its origin in the exhilaration of love and conviviality, or, better still, in the exhilaration of the dawn and the fresh breezes and scents of spring-time. With the mood are invoked its attendants, the characteristic symptoms and expressions of mirth—smiles, sport, laughter, and the dance. From this personification the poet passes by an easy transition, first, to the sounds and scenes in nature most congenial to the mood, then to the things which feed and stimulate it, the tangible pleasures of free-hearted human life:—the farmer's savory dinner, the happy harvest

field, the holiday merriment out-doors and in-doors, winding up at night with fairy stories over the nut-brown ale. From these the poet turns to the nobler pleasures of art and imagination — romance, the masque, comedy, and music, divinest of them all. Then a single touch to bring the setting once more to mind, and the poem is complete.

The student is now prepared to attack the following questions: 1. What is the thread of connection on which the numerous items of the central portion of the poem are hung? 2. How does the poet make the transition from frame and setting to nature, from nature to society, and from society to art? 3. Taking up specially the section which deals with the sights and sounds of nature, make an analysis of its contents, somewhat as has been done above for the other sections, but more in detail. 4. Has the poet wrought this material into a few complete and finished landscape pictures,* or has he given us instead a series of suggestive hints linked together in some other way? Is it possible to determine which of these two methods is best adapted to Milton's general plan of presentation?

LESSON II. IL PENSEROSO.—1. Make of this poem a careful study on the general lines laid down in the introduction to Lesson I. 2. Work out for it also the problems

*Such for example, as the opening scenes in *Evangeline*. And yet it is well to recall in this connection the fundamental difference between the painter's art and the poet's. Both artists must select, not only because the infinity of nature is beyond human power to represent, but even more because selection under the guidance of artistic feeling, is essential to that subtle harmony of presentation which alone is art. But the painter presents his scene directly to the physical sense. The eye sees form, color, light, shade, relief, and perspective on the canvas, just as it sees them in nature; and the mind must then interpret these to itself in terms of feeling, such as beauty, pathos, or sublimity. And it is these, rather than objective accuracy or reality, which are the true end of art. The poet, on the other hand, though unable to render the direct, visual impression with anything like the painter's completeness, is able to communicate the emotional and spiritual meaning of the scene directly to the mind, and along with it just enough suggestion of outward things to enable the reader to reconstitute the scene visually for himself. Completeness or finish therefore, in the case of a poet's pictures, depends not so much upon the amount of visual detail suggested, or upon its accuracy, as upon the inevitableness with which these details fall into their destined places, and upon the stimulus given to the reader's imagination to go on and complete the picture.

suggested in the questions of that lesson. 3. Put the two poems into relation with each other. 4. Try to give a clear and full answer to the question, How has Milton in these poems dealt with nature?

LESSON III. THOMSON'S WINTER.—This poem is also the presentation of a mood, but a mood of nature instead of a mood of man. After a careful study of the poem as a whole, and a tentative analysis of its parts and structure, take up the following questions:—

1. Is winter, as here presented, individualized—the winter of some definite year and region,—or is it generalized? Explain somewhat in detail. What is the connecting thread upon which the various items of the presentation are hung? What portions of the poem—how much space in all—are devoted to the visible and sensible aspects of the season? What materials other than this are used,* and how are they made to contribute to the representation of winter?

2. Recalling the recent studies from Milton, consider whether the moods there presented, and the scenes from nature, are individualized or generalized? Explain in detail. In Milton's case, if we except the purely formal device of personification, we have seen that the mood was not presented directly at all, but only as involved in things with which the mood is associated,—its causes, symptoms, occasions, attendant circumstances. Is Thomson's method here essentially the same as that of Milton, or is it different? Illustrate your answer by a brief recapitulation of the items of Thomson's presentation. With Thomson's poem compare Whittier's *Snow-Bound*—already studied under another head—with reference to its generalization of the season, to its general method of presentation, to the place which the

* In all this study it should be borne in mind that while it is the aim of science to give us rationalized knowledge, it is the aim of poetry to give us right feeling. The excellence of a poetic presentation of winter, therefore, does not consist at all in the fullness and accuracy of its statement of the facts of winter, but in the sureness and naturalness with which it kindles our feeling. From this point of view it might be an interesting speculation as to what would become of this poem, if all this other material were left out.

season holds in the scheme of the poem, and to the completeness and finish of its individual scenes.

LESSON IV. EXTERNAL NATURE IN NARRATIVE POETRY.

—If we take up once more the poem of *Evangeline*, we shall find that its method in some respects bears a striking analogy to the presentation of a drama on the stage. The opening picture of "the forest primeval" and the "deep-voiced neighboring ocean" is like a stately curtain on which we gaze awhile until the drama begins. Presently the curtain rises on a scene in the fair Acadian land—the valley, the meadows and fields, the forests and cloud-girt mountains, the village with glimpses of its peaceful human life. Upon the stage, so furnished, two characters, father and daughter, stand forth just long enough at first for us to catch their figures and bearing. We see *Evangeline* pass down the village street from church, and we seem to follow her to her home on the hillside overlooking the sea—the farm-house embowered in trees and vines, the orchard, the well, the sheep-folds, and the barns with weather-cocks aloft and doves hovering about. Suitors come wooing the fair maiden—one above all the rest. And now with a touch of the poet's wand which the dramatist cannot use, we have a glimpse backward in time, and see the beginnings of a childish friendship, and its ripening into love. We are now upon the threshold of the story.

When the curtain rises again, it is on a rich autumn landscape; all nature is suffused with the warmth and splendor of Indian summer. Presently the sun sinks, and in the gloaming we see the flocks and herds driven up from pasture, the hay wagons returning from the marsh, the milking of the cows, and the completion of the out-door duties of the farm. We now pass indoors to the quaintly furnished room, and see the farmer in his easy chair before the fire, and his daughter spinning beside him. The real action of the story begins at this point with the arrival of Basil, with his forebodings as to the errand of the warships,

and with the drafting and signing of the marriage contract—the two threads whose entanglement makes all the sad tale thereafter. The evening ends at curfew, and the curtain falls upon the maiden in her chamber, and the lover lingering on his homeward way to catch the gleam of light from her window.

And so it is throughout the poem. There is little formal narrative, but instead a succession of finished pictures and scenes producing the effect of narrative—but with far more lingering richness and splendor—until the great curtain falls on the last scene of all, and then once more for a moment we look upon "the forest primeval" and hear the "deep-voiced neighboring ocean."

If we examine the method of these presentations, we shall find it somewhat as follows: First of all comes a sketch of the great natural features of the scene in their general aspects, outlines, and tones. The attention is then focussed upon some special portion of the field with sharper definition and clearer detail, so that the movement of life is presently discovered in what before was merely inanimate nature or landscape. Last of all, out of the unsorted mass of life, individual characters emerge, and proceed to speak and act before us. Nature, that is, is presented to us as the background and setting of human life and action—that out of which these grow, and into which they melt away again.

The student may now profitably complete for himself the analysis of the pictures and tableaux of *Evangeline* begun above, noting, as he passes, any striking turns of the presentation, and any effects of identity or of contrast between the tones of the setting on the one hand, and the tones of human feeling and action on the other, and especially any uses of material from external nature other than those already noted.

LESSON V. Make a study of Scott's use of external nature in selected cantos of his *Lady of the Lake*—say cantos I and III—or even throughout the whole poem. Is

his use of it more or less varied than that of Longfellow in *Evangeline*? Is it notably different from that?

The method of study here suggested may be profitably extended to such poems as Scott's *Marmion*; Tennyson's *Enoch Arden*, *The Gardener's Daughter*, and *The Brook*; Arnold's *Sohrab and Rustum*; and even into the realm of prose, in the case of many of our standard novels.

LESSON VI. NATURE IN LYRIC AND REFLECTIVE POETRY.—In Burns' *To a Mouse* and *To a Mountain Daisy*, and in Bryant's *To a Waterfowl*, we find examples of a treatment of nature, the chief features of which are the sharpness and singleness of the initial impulse from nature, and the clearness and vibrant quality of the resultant feeling and its expression. The study of these should result in a brief analysis and interpretation of each, setting forth its starting point, the poet's initial mood, the development of thought and feeling, and the special features of expression. A summary then of the whole should show the essential characteristics of the group, the points of likeness between the members in origin, in method, and in result; and the individual differences in mood and treatment.

LESSON VII. A study of Shelley's *Skylark*, Wordsworth's *Skylark* and his *Cuckoo*, on lines akin to those suggested in the last lesson, but bringing out strongly the new features of lyric emotion and the means of its expression. Material for further comparison and contrast may be found in such poems as Keats' *Nightingale*, Bryant's *Robert of Lincoln*, and, more remotely still, Shelley's *Lines written among the Euganean Hills*.

LESSON VIII. A more intimate and abiding relationship between nature and the poet may be studied in Wordsworth's *Lines written near Tintern Abbey*, and in his *Ode on the Intimations of Immortality*; compare also his lines "Three years she grew in sun and shower." Outline the development of thought in each of these

poems. Discuss their essential kinship and their specific differences of presentation. What place does nature here occupy in the poet's world and the poet's heart? Are there any foreshadowings of such an attitude in any of the poems already studied?

LESSON IX. Summarize this portion of our study in a clear statement of the various ways in which poetry has been seen to deal with external nature. If our examples may be taken as historically typical of the progress of poetry, point out what indications there are of change in poetic attitude toward nature, in responsive feeling, and in technical skill of expression.

III. HOW POETRY DEALS WITH THE DEEPER PROBLEMS OF LIFE.

From one point of view, as Matthew Arnold has told us, all noble poetry is "a criticism of life," involving not merely a vision of its fleeting aspects and charms, but a sense of its deeper import as well, and of its relation to things unseen and eternal. This is obviously true of such poems as *Evangeline* and *The Ancient Mariner*; but it is none the less true of all that we have so far studied in this course. Behind the bright figure of *L'Allegro*, for example, is the question: How with such a temperament may life be best worth living? And Milton's answer is there for all who care to read it; an answer full of the eager sensitiveness of youth, but full also of the high seriousness of a man convinced that he "who would not be frustrate of his hope" of being a great poet, "ought himself to be a poem." In its frugality, its absence of all loose and disordered appetite, its "plain living and high thinking," and the ideality of its delights, how unlike is Milton's scheme to any scheme of life propounded before by a professed votary of pleasure! Underneath the pomp and pageantry of the seasons, Thomson feels the pathos of human life caught in their resistless whirl and swept along "till pale, concluding

Winter comes at last." Yet not altogether "at last;" for, in the certainty of a new Spring beyond this "last," the poet reads the assurance of a second birth for all that is noblest in man, "from pain and death forever free." And, aside from its fascinating story, what is *The Lady of the Lake* but one glowing tribute to constancy, courage, and courtesy, those supreme virtues of a lawless society and of troublous times? And what, indeed are these but Faith, Hope, and Charity read with a different emphasis?

It might be well thus to go through the whole list of poems, seeking to discover in each the undertone which gives richness and vibrant quality to the notes of the melody. But, leaving that to the student's leisure, let us turn now to a few examples of a more direct and definite treatment.

LESSON I. THE SHADOW OF DEATH.—1. In Bryant's *Thanatopsis* we have a simple, direct, and tonic treatment of the grave theme of Death. A study and analysis of the poem should bring out (a) its points of kinship with the group of poems last studied, and its specific difference; (b) the starting-point of the poet's thought; (c) the manner in which the theme is reached; (d) the play of thought, of feeling, and of imagination about that theme; and (e) its conclusion.

2. With this reflective and didactic poem compare the lyrical and reflective *Lines to a Waterfowl*, already studied, to bring out the widely differing starting-point, mood, and treatment, which lead up to a conclusion akin to that of *Thanatopsis*, yet subtly different.

3. A further comparison and contrast with Tennyson's *Crossing the Bar*.

LESSON II. In this connection it may be well for the student to take up Browning's famous poem, *Rabbi Ben Ezra*, an utterance of surprising originality and power on the place and import of old age in the plan of life. The

poem will require much careful study to master its content and meaning, and to appreciate its splendid imaginative power. But when this is done, it should be a comparatively simple matter to put it into such relation with the works already studied, as shall bring out its essential contrast with them in origin, in idea, in feeling, and in manner of expression. For a wider comparison still, the student may be interested to read what Socrates says concerning death in the closing section of Plato's *Apology*, and again in his *Phædo*, and what Cicero thought of old age in his *De Senectute*.

LESSON III. BEREAVEMENT.—In the poems of the last lesson we have the poet's attitude and feeling in view of death as an experience which he himself must face. There is, however, another point of view in which the poet's thought is stirred by the death of another. Among the most famous utterances of this sort in English poetry is Milton's *Lycidas*. The poem does not necessarily imply an uncommonly close and tender personal relation between Milton and his friend; but only that a young college-mate of much promise, well known and generally admired, a budding poet like Milton himself, and a clergyman whose character and ability would have counted for much in the impending warfare against ecclesiastical abuses,—had been cut off untimely. The points to be specially noted are:

- (1) The division of the poem into elegy proper and epilogue, with corresponding shift of poetic impersonation.
- (2) The pastoral setting—a sort of poetic make-believe for removing the features and problems of life under consideration away from the complexity and sordidness of actuality, and for investing them with an atmosphere of simplicity and ideality. This feature should be carefully worked out.
- (3) The movement of thought and feeling in the various divisions of the poem, with notice of the way in which the transitions are effected.
- (4) The deeper questions touched upon:—What are they? How do they come up in this

poem? Is their importance signalized in any way? What is the poet's answer to each?

LESSON IV. With Milton's stately elegy may profitably be contrasted as to feeling, mode of expression, general effect, and self-revelation, his sonnet on his Deceased Wife, and Tennyson's "Break, break, break!" It will be noticed that in these pure lyrics the pressure of the problem of bereavement calls forth no distinct solution in thought, but in feeling only. Gray's *Elegy* affords still another point of comparison. Tennyson's *In Memoriam*, the masterpiece of all this group of poems, is probably too complex and too subtle for this elementary course.

LESSON V. THE STRUGGLE WITH EVIL.—Milton's poetical works, as Professor Dowden tells us, "are various renderings of one dominant idea—that the struggle between good and evil is the prime fact of life; and that the final victory of the righteous cause is assured by the existence of a divine order of the universe, which Milton knew by the name of 'Providence.'" Thus underneath all the splendid pageantry and music of Milton's *Comus* may be felt the buoyant optimism of the young idealist and poet;—may be read his triumphant answer to the question, What is the fate of innocence and virtue in the midst of the snares and dangers which everywhere beset them? In his later poems the question itself becomes modified through the poet's experience of struggle and apparent defeat; the whole tone of his thought is graver, as may be seen in his *Sonnet xxii*, in *Paradise Lost*, and in *Samson Agonistes*; but his answer is no less assured.

The study of *Comus* should bring clearly into view the noble grace of the compliment Milton pays to the family which the occasion was to honor, the aerial phantasy which forms the framework of the poem, the delicate charm of the characters, the lyric effects, the constant presence of the dominant motif, and a movement of the whole poem like

that of the Lohengrin music, descending out of the infinite spaces to touch our human need, and ascending again to heaven at the close.

LESSON VI. DUTY.—Wordsworth's Ode to Duty may be taken as a lofty meditation on the purpose and function of Duty in God's universe, on her beneficent and far-reaching power, and her heavenly beauty, till the poet yields himself lovingly to her guidance and discipline. In studying this poem the steps of thought should be carefully followed throughout, the pregnant utterances should be made clear by explication of what is involved in them, the exquisitely chosen diction and the noble imagery should be pondered until the mind is possessed of their power and charm. With this may then be compared Milton's thought on the same subject in the Sonnet on his Blindness. Finally the attempt should be made to set forth in plain terms the essential difference between the two in conception, in poetic embodiment, in mood of feeling, and in expression.

LESSON VII. THE BEATIFIC VISION.—"*It is not in heaven, . . . neither is it beyond the sea; . . . but the Word is very nigh unto thee, in thy mouth and in thy heart, that thou mayest do it.*"

The Vision of Sir Launfal, like a piece of modern music, is a composition of many elements and of varied orchestration; and its separate movements are so elaborately finished as to have a substantive value and character of their own, quite independent of their part in the poem as a whole. Yet all this splendor and music is made to illustrate a single and a simple theme. A study of the poem should result, first, in a clear understanding of each of the parts in succession,—a statement of its special theme, the method of its development, and the striking features of its embodiment and expression;—and, second, an understanding of the whole, with its master-theme, and the bearing of all the parts upon it. Such a study will cause us to pass in

review each of the special fields of poetic treatment so far attempted, and thus may serve as a fitting summary and conclusion to this short course, and a beginning for what lies beyond.

This little syllabus was begun in response to a request from a group of teachers in one of our Northern counties, who had organized themselves into a club for the study of literature, and who felt the need of guidance and direction. They were busy, hard-working folk, who could meet but once a month; and, for various reasons, they desired that the material for their study might be drawn from the English requirement for entering the University. These conditions have been kept in mind in the preparation of the lessons. Yet, in the interest of a wider group of students who might make use of them, and to secure at points a more complete view, I have not hesitated here and there to refer to material not found within the narrow field designated.

As to method, I have endeavored to show what mature minds, without extensive libraries to draw upon, and without apparatus of critical theory—not specially versed even in literature, yet interested in it—may accomplish in the way of direct, objective study of the poems themselves. In no case has any attempt been made to exhaust the subject, but rather to secure clear and definite answers to a few questions, to develop a few facts, to discover a few relations, to make thought lead up to statement, to make statement react on thought, and to make the effort cumulative.

A word of caution may not be amiss. The treatment here suggested is not, as a whole, adapted to the needs of immature minds, such as, for example, those of pupils in our high schools. Whatever of grasp or of insight may come to the teacher from such study, is sure to reappear as added richness and power in his teaching of these subjects; but he need not enforce these things upon his pupils by

precisely these methods. And yet, the discipline here aimed at—the habit of looking at the heart of things, and of dealing with the material of study vitally rather than mechanically—can never be out of place, since it lies at the very root of all true culture.

ETHOLOGY: STANDPOINT, METHOD, TENTATIVE RESULTS.

By THOMAS P. BAILEY, JR.

PART II.

On page 550 of the last number of the UNIVERSITY CHRONICLE (December, 1898) the following words occur:

"Without some sort of working hypothesis the complexity of the subject baffles all efforts. The doctrine of biological development, differentiation and integration, modified by philosophical criticism and by the view of character expressed in the first part of this paper,—this is the hypothesis, the most organic one to hand. Each character tendency is represented as differentiating into more specialised form; as becoming integrated in some of its aspects with certain tendencies and in other aspects with other tendencies. All the higher instincts are prophesied in the lower; all the lower are included and transformed in the higher."

This hypothesis (which *in abstracto* lays no claim to novelty) leads to some "tentative results" which are very roughly indicated in the next section. Certain stages and lines of character development, which I feel compelled to picture to myself diagrammatically, may well be compared with the well-known views of Dr. W. T. Harris. Such a comparison may serve as an introduction to our hasty study of the diagram. Of course, Dr. Harris is in no way responsible for the use I make of his views. In the *Educational*

Review for January, 1899, (p. 12), he gives the following stages in education; they are not intended, I presume, to be exhaustive, or to be regarded as hard and fast distinctions. (The italics in the quotation are mine.) Says Dr. Harris:

"Recapitulating for the sake of clearness: (1) the infancy period of education in the kindergarten requires a method of instruction adapted to the *symbolic* and *imitative* stage of the mind. (2) The elementary school demands the method that can sieze and analyze *typical facts*, these facts being of the first order, that is to say, facts that are not yet treated as organized into groups by science but are capable of such treatment. (3) Secondary education requires the method which deals with the large facts that include *entire groups of facts systematically arranged*, while higher education deals with a still larger fact, namely the *several sciences* unified into a single group by the *comparative method* so that each science helps explain all, and all, each."

Let us subdivide the above stages and restate them in terms of character-development. The "symbolic" and "imitative" stage becomes (I) the imitative, or stage of *habit* (first triangular section— x_1 —of Fig. 1 of the diagram), (II) the symbolic, or stage of *spontaneity* and play (Fig. 1, first circle— X_1). Dr. Harris' stage of "typical facts" (2) may be divided into: (III) the formal stage of *custom* (x_2); (IV) the "content" stage of *concrete-generic* (typical) facts—natural, aesthetical, social (X_2). Secondary and higher education are included in stage (3) of Dr. Harris' division: (V) the stage of *law*; and (VI) that of *science*, in the widest sense of the term. Here we have three formal stages (*habit*, *custom*, *law*) alternating with three content or formative stages (*spontaneity*, *types*, *science*). The difference between formal and formative is one of emphasis only. In the central axis of character, "form and content" are one. What we said in the first article about the uniqueness and solidarity of character must be borne in mind here. A few words of comment on each one of these six stages may serve to show that they

are in some degree represented in experience, and yet are not intended to be either inelastic pigeon-holes or an exhaustive list of sharply defined stadia. We may as well expect to find sharp lines of division in embryological development, as to expect them in the development of character.

(I) The stage of habit (x_1) is what Comenius called the "education of the mother's lap." Here the biological tendencies and instincts become orderly and systematic, but without having their plasticity tampered with. Generic rather than specific habits are to be formed; the child is to gain an equilibration of *psychical* receptivity, *self-assertive* reaction, and *sympathetic* responsiveness (see diagram, Fig. 1, triangle x_1). Kindergartners often find that the children coming to them need to have this habit-stage overhauled and set to rights before the *spontaneous* side of character can be further developed. The kindergarten that neglects this adaptation of spontaneity to habit is worse than useless. If this is true, quite a large number of kindergartens have little reason for being.

(II) While the stage of spontaneity (X_1), with its animal playfulness, gregariousness, and appropriateness, is the essence of the kindergarten age, here as always, is a tacit assumption of higher stages, and a reaching out toward them. Here the child may very well grow naively into greater definiteness of thought and speech, greater social reverence and dependence, more developed sense of propriety in dealing with *meum* and *tuum*. Not to reach up in this way is to justify in large measure the reproach of some primary teachers that the kindergarten unfits children for discipline and formal work.

(III) In the stage of custom (x_2) we find the main work of the primary grades (say the first four). The empirical use of the tools of thought, the ability to dig out a task unaided, reverent hero-worship of a catholic kind—these seem to be the main characteristics. Not only do we see these traits manifested in part in the "formal" work of

language and number, but we see them quite as clearly in the learning of "location, direction, distance," etc. (See, for instance, Berkeley Public School Manual, p. 20); and in the careful oral reproduction of stories. This stage does not forget to care for habit and spontaneity. Indeed, no period of education can afford to neglect any of the basal stadia. Even the university professor insists on habit—sometimes unduly! On the other hand, the primary school cannot afford to refuse an outlook into the stage above it. Quite often, individuals who have great difficulty with the formal work are kept alive mentally by being able to see "what good they'll get out of it," and by "getting tastes" of that good. Very often either grammar school work on the one hand, or kindergarten work on the other, has to be given to primary school children. The principle underlying this remark can be applied to all other grades and stages.

(IV) The grammar grades carry on the work of primary drill, but the study of typical groups of facts becomes emphasised. Here (X_2) history, geography, and literature become more clearly differentiated and also more clearly co-ordinated. Geography studies the natural and economic environment of man; history studies individuals who typify the groups they lead; literature, too, becomes valuable for "what there is in it" of the typically heroic vividly portrayed. Ethicality is the integrating force here—not ethics, but ethical characters; not ideally spiritual characters, but heroic ones of custom transcended yet respected. The golden age of the Greek, the Roman, and the Hebrew, and the modern heroes showing forth like essential traits—these typify the content of this predominantly "formative" stage.

(V) Our best high schools seem to exemplify the stage of law (x_3). Think of the place filled by foreign languages and mathematics. In history, the growth of laws, constitutions, social institutions, are studied. The *results* of historical study are used to teach methodical analysis and synthesis. There is historical drill, not in habit and custom, but in law. What are the representative natural

sciences of the high school? Physics and chemistry. Now these, as taught in the high school, are useful, not so much on account of the knowledge they give, but for the sake of the methods they teach. The adolescent needs law and method more than anything else. Of course, this presupposes that the formal and formative work of previous stages has been well done. Then, too, the high school student has a right to have the college attitude started in him.

(VI) In the college stage, study becomes more or less scientific (X_3). The high school training has to be kept up in large measure, but the student's surroundings are more significant and more universal. His work is more abstract and at the same time more specialised. The whole round of human thought and activity comes before him in all its complexity and interconnectedness. Knowledge and training go hand in hand. One rejoices alike in the power of faculty and in the truth he finds. He seeks the truth that shall make him free or *spiritual*, and the seeking itself frees him.

We might add another stage for the higher work of investigation, of specialty. Here a man "comes to the point;" happy he whose specialty is the point of a *character* with breadth and depth and height enough.

Let us now turn to a more formal study of the diagram.

III. SOME TENTATIVE RESULTS. In Fig, 1 of the diagram* we have a representation of the development of

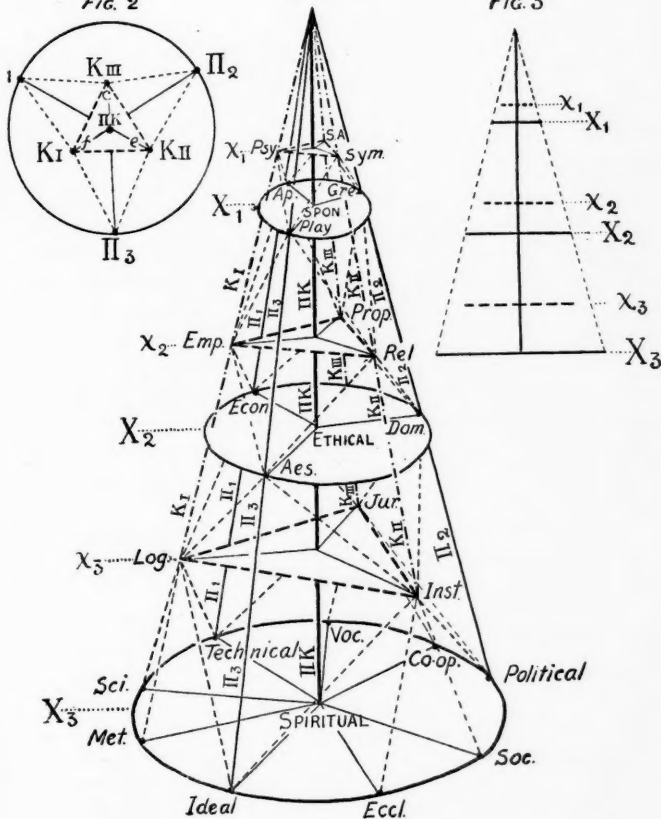
* My thanks are due to my friend Mr. G. T. Winterburn, Instructor in Drawing, for his careful execution of the diagram.

For convenience, I give a list of equivalents of the abbreviations in the diagram: Biol = Biological; Psy = Psychical, Sym = Sympathetic, S-A = Self-assertive; Ap = Appropriative, Gre = Gregarious, Spon = Spontaneous; Emp = Empirical, .Rel = Religious, Prop = Proprietary; Econ = Economic, Aes = Aesthetical, Dom = Domestic (Gentile); Log = Logical, Inst = Institutional, Jur = Juridical; Sei = Scientific, Met = Metaphysical, Ecel = Ecclesiastical, Soc = Societary, Co-op = Co-operative, Voc = Vocational.

FIG. 1
BIOL.

FIG. 2

FIG. 3



character by differentiation and integration. The development starts at Biol., the apex of the cone, and culminates in the circular base (Technical . . . Political . . . Ideal; Spiritual), which includes within itself all that has preceded it. The three surface lines that spring from B (Biological)

stand for "lines of development" (Π_1, Π_2, Π_3); the circular parallels that intersect these lines represent "stages of development" (X_1, X_2, X_3). Within the cone, and forming the edges of the triangular pyramid, are the "regulative lines" (K_I, K_{II}, K_{III}), and connecting them are, the "regulative stages" (x_1, x_2, x_3). The diagram shows the progressive broadening, deepening, specialisation, and integration of intelligence.

Fig. 2 is a ground-plan of a cross-section of the figure, and shows the relation of the lines to one another and to the axis. Thus K_I , the Psychical-Empirical-Logical line, strongly affects and is affected by the lines of industry and art ($\Pi_1 = \text{Biolog} \dots \text{Tech}$, $\Pi_3 = \text{Biolog} \dots \text{Ideal}$); K_{II} , the Sympathetic-Religious-Institutional line is specially connected with the lines of art and power ($\Pi_3 = \text{Biol} \dots \text{Ideal}$, $\Pi_2 = \text{Biol} \dots \text{Polit}$); while K_{III} , the Self-assertive-Proprietary-Juridical line connects closely with the lines of power and industry ($\Pi_2 = \text{Biol} \dots \text{Polit}$, $\Pi_1 = \text{Biol} \dots \text{Tech}$). All lines connect with, and are connected by, the axis ΠK ($\text{Biol} \dots \text{Spir}$).

Fig. 3 represents a longitudinal section; it shows the developmental stages (X_{1-3}, x_{1-3}), which are indicated in Fig. 1 by the triangles and circles.

Let us first review briefly the lines of development, beginning with the industrial line ($\Pi_1 = \text{Biological-Appropriative-Economic-Technical}$). While all the lines, stages, and tendencies contain all psychological aspects (intellect, feeling, conation, emotion), and hence both aspects of intelligence—sensational (π) and relational (κ), line Π_1 is more sensational ("getting along," wealth, property, etc.) than relational, and more *objectively* sensational ($\pi_1 =$ "senses," objects, facts, the weighable and measurable) than *impulsively* sensational (π_2) or *affectively* sensational (π_3). This line is characterised by feeling (f) and conation (c) rather more than by emotion (e). Political economy has well brought out the characteristics of the line: ponderable wealth, calculus of pleasure, enterprise, individualism,

etc. The "Historical School" has tried to show the connection of Π_1 with Π_3 and Π_2 . This attempt easily becomes vague and sentimental. Still, even superficially, these lines are connected. *Homo aëconomicus* is an abstraction, but all science must abstract for the sake of convenience. Ethology abstracts only to discriminate while connecting. In the industrial line, snatching what you can, hunting, etc. (Appr), precede storing-up, agriculture, etc. (Econ); later still comes the Technical tendency (specialisation, machinery, technical arts and professions). Of course some measure of the preceding stages *must* be contained in the succeeding—although some people resent the native 'appropriativeness' of "private property." In contact with the scientific instincts or tendencies (Sc), and the vocational influences (Voc), and influenced by the higher civilization in general (Tech . . Ideal . . Pol; Spir), the ideas of life-work, responsibility for talents, stewardship to society, etc. are becoming stronger. The biological and appropriative may be "kept under" the technical and transformed by it; but they will always be in evidence, and will constantly tend to "get on top." Conditions of lawlessness and national immorality tend to make the individual "revert" to his animal stages. There can be no possibility of progress without the possibility of reversion. The fresh blood of the barbarian is a good thing if a sufficient amount of it—and not too hot—goes to the brain.

The third line (Π_2) is the Biological-Gregarious-Domestic (or Gentile)-Political. It is especially characterised psychologically by the impulsive-sensational (π_2) element, and by conation (*c*) and emotion (*e*). Resistance, the sense of power, sovereignty, striving, ambition; the getting-together instinct, caste, party, social solidarity, and so on—these we find whether we consult Plato or Aristotle, Hobbes or Bluntschli, Ihering or Maine. Fitz James Stephen's essay "Liberty, Equality, Fraternity" is an eloquent argument for the Force differentia of this line. History is one long comment on the individualisation

and socialisation of authoritative "Force." Gregariousness is a patent animal and human fact without which the exclusive gentile life is impossible. The horde (or temporary group), the clan, the state, seem to be nodal points in political development. There are no doubt transitional forms, and innumerable specific differences. The so-called progress "from status to contract" seems rather to be the *differentiation* of status and contract, of the industrial life and the political, and the closer relating of both to the conscience. A "social contract" is perhaps as true (at a late stage of development) as an industrial status. Neither is "typical." The best political instincts are those which include all that is vital and valid in gregariousness and gentilism, and which relate themselves most organically to other lines of character, especially to the internal axis of autonomous self-respect and respect for the other autonomous persons who together with ourselves form the state. Mr. Jenks may be right in believing that the clan and the state are ever opposing each other. Opposition in some form characterises the political line, (witness the party-system); but the state can overcome the clan only by including and subordinating it.

The ideal line (II_3) of the development of intelligence is strongly affective (π_3); it is characterised by emotion (e) and feeling (f) rather than by conation (c). Professors William James and C. Lange have identified the "affective sensation" with the emotion. It seems to me that there is about the same amount of truth in this as in the identification of feeling (f) with sensation (π_1), and of conation (c) with impulse (π_2). Sensation, impulse, and affect are the *content*-aspects of feeling, conation, and emotion (See Fig. 2). In the pictorial language of matter, we may say that the outer germ-layer or periphery (*ectoderm*) is specially concerned with objective sensation (π_1), which best represents the specific difference of the sense-organs and the specifically intellectual aspect of sensation. So impulse (π_2) and the muscle-layer (*mesoderm*), and affect (π_3) and the visceral

layer (*entoderm*). But each layer and all nervous tissue is the nervous expression of generic and *organismal* feeling, conation, and emotion. Hence these aspects of consciousness are generic, organismal, while sensation, impulse, and effect are specific (organic). There is no such "specific energy" in the organismal phase as in the organic; nevertheless objective sensation will naturally go with those generic phases of consciousness which it most closely represents, and so with the others (impulse and affect).

Kant and others have noticed the absence of conation from art. Tolstoy has recently insisted on the infectious emotionality of true art productions, but he is wrong in stigmatising art for play and pleasure as "false." As emotion is predominantly sympathetic, and feeling psychical, we can understand why he should oppose the mere enjoyment aspect of the aesthetic instincts. Perhaps the development from Aesthetical to Ideal corresponds with the change from the "classic" into the "romantic." Our scheme would demand that the romantic include and transcend the classic. If the reader wishes to trace the connection between the biological and play instincts, and between the play and the aesthetical, he is referred to the works of Groos, Grosse, Baldwin, *et al.* The aesthetical-ideal relation is familiar to students of Greek life and thought, as well as to Herbartians and Ruskinians, not to mention others. Of course the specifically aesthetical element (perfection, honor, admiration, ideality, etc.) is not the only one. The industrial life contributes hedonistic features; the political life, compulsory features; etc. The place that art occupies here includes all the phenomena from the ploughing of a straight furrow because its straightness gives the satisfaction of harmony or fitness, to the production of masterpieces in literature, art, science, philosophy, etc. The aesthetical and ideal elements are clearly to be seen in all earnest, thorough, significant thought and life.

Coming to the "regulative lines" (K_I , K_{II} , and K_{III}) we find them strongly contrasted. The logical line (K_I) starting

with animal curiosity and "love of sensation" (psychical, Psy) leads to the empirical tendencies (Em) of "common sense" and "intuitive concepts," and thence to the logical function that seeks for rule, principle, category. Here we find the beginning of the self-conscious and systematic search for causes, the stimulus to invention, the "knowing" side of conscience, and like phenomena; the logical instinct seems to be the regulative center for the Technical, Scientific, Metaphysical, and Ideal tendencies. Here we have the practical logic of the arts, the instinctive scientific methods, the spontaneous categories of philosophy, and the instinctive rationality of art. In reflectively perfecting its technique and method, academic art becomes self-consciously logical, and often fails to carry over its aesthetical spirit into its technique. The reflective order reverses the instinctive. It is the reflective order that gives us our logic-books and formal methods. The connection of the empirical instincts with the economic and aesthetical will be evident, although some abstract economists and some over-zealous idealists in art need to be reminded of the fact. Nor will it be denied that the perceptual or psychical instincts (Psy) differentiate and stimulate the intellectual side of appropriateness and play. The logical line is the one most studied by psychologists and philosophers.

The Sympathetic-Religious-Institutional line (Sym-R-I) is relational rather than sensational, but is very unlike the K_1 line in the form of its relationality. K_1 stands between Π_1 and Π_3 and hence partakes of the objective-sensational nature of the one and the affective nature of the other; but K_{II} (Sym-R-I) has the affective of Π_3 and the "ejective" or impulsive-conative and social-imitative qualities of Π_2 . Hence religion, for instance, is less objective and more ejective than "common sense." It tries to make up for this lack by the use of symbolism, ritual, etc. The Institutional laws of state (Pol), church (Ecclesiastical), Social Conventional, etc. (Societary), are more ejective (collective) and less objective than the logical laws of thought and

"nature." Sometimes the laws of the state simply stand for someone's logic. Such laws are not likely to stand of themselves. So logical laws are sometimes framed to explain existing institutions. They cannot be depended on to furnish truth. The distinction between the "association of ideas" in the psychical instinct and of persons in the sympathetic has been commented on from the beginning. The "egoism-altruism" antithesis is in part a rather crude attempt to define this relation. The K_{II} line is intended to show the sympathetic-religious-institutional regulation of the "individual and the state," that is, of these two aspects of both individual and the society of individuals. Philosophers, historians, theologians, and writers of the Fustel de Coulanges and Hearn type, have brought these relations out pretty clearly. The anthropomorphism of religion, its tendency toward conservative institutionalism, the hero-worship basis of patriotism, "genteel society," churchmanship—are facts that need only be named.

K_{III} (Self-assertive-Proprietary-Jural) is the line leading from animal egotism to the juridical recognition of the rights of self and others. Its economic influence on the one hand, and political on the other, is evident. Self-assertion manifests itself both psychically and sympathetically. The proprietary instincts include much of the primary meaning of both "property" and "propriety." A good illustration of this is seen in early legal codes, where the sections devoted to Theft and Procedure occupy so much space and prominence. Vocational and co-operative rights and duties are peculiarly modern outgrowths of the Jural instincts. When the three regulative lines are taken together we see the incompleteness of the "Egoism-altruism" antithesis.

Next we must notice the "stages of character development" (represented in the diagram by the circles), and also the "regulative (or formal) stages" (represented in the diagram by triangles).^{*} Taking up the latter first, we have "habit, custom, and law." The first stage (x_1) is the

beginning of "invention and imitation." (Tarde, Baldwin, *et al.*), of "association," suggestion, self-preservative habits, etc. Here achievements are mechanised in order that they may serve as a fulcrum for the spontaneity and higher "habit" of higher stages.

The next formal stage is custom (x_2). Perhaps this marks as nearly as possible the beginning of distinctively *human* life—belief and custom, self-consciousness and language, worth and privilege. The educational implications of this stage are particularly abundant, and, I think, fruitful, but I forbear. Here, too, we are helped to distinguish magic, sorcery, etc., which are empirical forms of animism, from worship, sacrifice, etc., which are religious forms, and from blood-revenge and torture, which are proprietary forms. Remember that the nearer the animal the phenomena are the greater difficulty we have in distinguishing character-phases. For instance, we separate science from social position very readily. Not so the primitive man, if any of the writers on this subject is to be trusted. Max Müller's contention that "linguistic" is a natural science and Whitney's that it is a social science, are both true in more ways than one, according to our scheme.

The regulative stage of law (x_3) is seen historically in the later development of the Greeks, Romans, and Jews. Roman law is a monument of the juridical tendency; Rabbinical law shows law on the institutional side; Greek logic, grammar, etc., show it in the logical direction. The law, whether of thought, rights, or institutions, has ever been the school-master to lead men to a higher civilization, and yet individuals and nations sometimes become arrested at this stage.

In the character-stages, X_1 (Ap-Pl-G) seems to typify the higher animal life as it is described by the comparative psychologists. In education, the kindergarten attempts to make this stage characteristic. We must not forget that the scientific, ethical, and all the higher instincts are represented

* See p. 35.

in human beings at the lower levels. The play of a people and their natural gregariousness and "acquisitiveness" are very significant prophecies of their future attainments. Note the character-traits of our Teutonic ancestors.

The second developmental stage (X_2) seems to be dominant in all ancient civilisation. Note the ethical internality of the Hebrew prophets, the artistic life of the Greeks, the *patria potestas* (D) of the Romans, the economic activity of the Phoenician, Carthaginian, and other commercial cities. Note, too, slavery, contempt for manual labor, monumental public buildings, the city states with their clan organization. True, Greece and Rome advanced beyond this stage. Perhaps all the civilized peoples of antiquity went beyond it. But it expresses, I think, the very genius of antiquity. The Greek and Roman "democracies" were gentile in their best days. Ancient morality, whether Stoic or Epicurean, was aesthetical, economic, and domestic. Trade and commerce fitted in with a slave economy. *Individuals* in Greece and Rome, and very especially in Palestine, became true moderns, but they could not carry their compatriots to the heights with them.

The third stage (X_3) represents modern life, with its sciences and arts, its philosophy and personal conscience, its churches, its social institutions, its democratic state-life. The middle ages seem to have oscillated between X_2 and X_3 . Their best contributions were conserving institutions in Church and State and conserving logic in matters intellectual. No people ever had a uniform development of these lines and stages, for no individual ever had or (perhaps) ever will have such a development. At some historical periods the industrial line grew fastest, at others the political, at times they have grown together. The aesthetic-ideal line has often outstripped the others. The present tendency is towards greater integration as well as towards greater differentiation, but we can hardly be sure that our present stage is not as far from the final one (if there be such an one) as the Biological is from the Spiritual. I

should like very much to discuss (from the standpoint of Ethology) this last stage—the relation of state to public opinion, of society to church, of philosophy to science, of science to the arts, of vocation and coöperation to conscience, but time and space are lacking. Of course I could not presume to discuss any of these subjects as a specialist, but I think that this view introduces great practical unity into the maze of ethological relations, and helps to do concretely and generically what the "philosophy of history" and "sociology" attempt to do abstractly.

Although this brief sketch is hopelessly incomplete and although the most valuable technical features of the work have not even been mentioned, it is barely possible that I have said enough to convince a few persons that it is worth while to carry on the work. If so, I must confess that coöperation with others interested in these matters becomes a necessity. Not only is special knowledge needed to carry on study along the many routes indicated by the scheme, but sympathetic criticism, or, if that is impossible, any sort of valid criticism, is still more necessary. For instance, ethology is more or less distinctly connected with such subjects as the philosophical sciences, psychology, pedagogy, jurisprudence, economics, politics, history, aesthetics, philology, literature, art (including decorative art, history of art, etc.), the history of the various arts and sciences, ethnology, anthropology, theology, etc., etc.—a formidable list.

In order to indicate some of the work being done in ethology at the University, let me mention some subjects and topics being worked on by graduate students: "Development of the Hebrew Character," "Emotion-Types," "Classification of Character-Types," Biography (J. S. Mill, Darwin, Napoleon, etc.); Ethology and the Kindergarten; Character-Results of Pedagogical Methods.*

*In Bulletin No. 13 of the University Library (issued since the first article) will be found lists of some of the typical books that are useful in this work.—Some references are given in the topical index. A comparison of the diagram in this article with the earlier diagram in the Bulletin will partially show two successive stages in the development of my ethological work.

THE CONDITIONS OF A CALIFORNIAN CIVILIZATION.*

By WILLIAM CAREY JONES.

The characteristic of our age is its intense consciousness. We aim to achieve results. Both ends and processes are consciously reflected upon. Even habit, according to which many of our actions are governed, is but the unconscious following of consciously conceived motives. We live far away from the childhood and youth of the race. The country that preëminently represented the adolescent stage of civilized man was Greece. Her culture came without a conscious aiming at results. Her young manhood lived, generation after generation, in a nobly active, but unconscious, pursuit of the idea that was immanent in nature. At first it was a mere, albeit full, living-out of the resources of the environment. The charm and beauty of sky and landscape, form, color, and odor, were assimilated into the very texture of man's being. Refined children of nature were the resulting product manifest in the population of Greece, especially of Attica. Generations of such intimate intercourse with nature in one of her most beautiful sanctuaries produced in this highly sensitive race motives and aspirations. A rich and manifold life was generated, finding its activity and expression in politics, art, literature, and philosophy. The ideal was realized out of nature.

*Read at a meeting of the State Teachers' Association, Santa Rosa, December, 1898.

But not in a moment, nor in a generation or century. "Life comes before literature," says Phillips Brooks. Unconscious, but assiduous and long, devotion had brought its results in a splendid, still matchless, and perhaps never-to-be-repeated civilization.

Twenty-odd centuries separate us from that age. An opulent inheritance, which we scarcely know how to handle, has been transmitted to us. For we are not the progressive offspring of the Athenians, but of far less intelligent races. We have produced complexities of situation which demand higher intellectual powers than even the Greeks possessed. It is an extraordinary condition of things that mankind has brought about. Individual man is ahead of the race. Conscience and ethics are beyond intellect. While society needs to be controlled by the intellectual powers, the standard of such control, as well as of individual and social action, is set by a moral demand, which is beyond the ability of his intellectual nature to meet. We are all at sea as to how to compass the results we have set before ourselves. We have conquered an imperial domain of industrial activities, of moral ideals, and of intellectual possibilities, and we don't know how to govern it. We have weaved a complex web about ourselves, and we have lost the thread that leads to the masterful position. Labor is divided, diversified, and emancipated, but the laborer is in worse thralldom. Riches are enormously accumulated, and the possibilities of spiritual and material happiness seem attainable, and yet the problem of poverty sets us aghast and helpless. Science has opened the heart of nature and converted her laws and processes to man's service, and yet life has become only more complex, toilsome, and feverish. Learning has become widely diffused, yet rational education is still distant. Democracy is overspreading the world, yet practical and efficient political management is all but lacking.

A higher grade of intelligence is needed. Not only does the situation call for a greater number of men of an intelligence equal to the highest in the world, but there needs to

be produced those of an intelligence higher than we now have. It is a crude thought which says that we have the best we deserve, whether in government, in institutions, in education, in social conditions. We, in fact, deserve far better than we have. The instincts and moral demands of the people are far better than their knowledge of how to satisfy them. Of course, the moral life of individuals and of communities is far from perfect. It is, indeed, for reasons we cannot here discuss, oftentimes very bad. But this fact does not seriously modify the statement that our moral longings are entirely beyond the competence of our intelligence to meet. A higher intelligence would enable us to live a higher moral life. The measure of a civilization is in the number of perfected men, perfected in intelligence and morals, that it produces.

"This age is great and strong," says Victor Hugo. There is no doubt about that. But its greatness and strength lie in making our civilization increasingly complex and difficult, not in solving the vital problems which its greatness constantly engenders. Or, its every solution is only partial and involves yet other problems. We need men of intellectual and spiritual power sufficient to realize the things which society is even now worthy of having. We need not a few, but many, men of such power. It behooves every community to set itself to the accomplishment of this object. It behooves especially all of us who are charged with any part of the guidance of society so to build upon ourselves that each succeeding generation shall approach nearer to the goal of the things worthy of it. The problem of civilization presents itself to each community in the world in much the same way as the problem of culture and character presents itself to the individual man. It is mainly a problem of self-culture. Self-making, in the higher sense, is the condition of the perfected society or of the perfected man. Imitation and conformity are indications of inferiority, unconscious or unconfessed, or avowed, as the case may be. The free and open mind, receptive to the

light and reason of all ages and of all the world, is equally essential to self-perfection. Cordial welcome needs to be given to spirits and influences which we lack or which are superior to us. We must needs be surrounded by an open intellectual atmosphere, filled with the divine breezes of all heaven and of all earth. But yet it is essential that we be true to ourselves, to our own race, whether that race be simple and single and pure, or composite, to our own traditions, ideals, and destiny. We must rear upon our own substructures an architecture that is consonant with its foundations, its surroundings, and its uses.

We are no longer unconscious, or semi-conscious, adolescents like the Greeks of thirty centuries ago, but adult men with all the burden of responsibility that consciousness and a knowledge of the world's experience give to action. We don't know whether to shirk or to act. If we resolve to act, we don't know in what direction to set our activity. Our half-understood historical knowledge misleads us. At one moment we lay too much stress upon the effects of environment. At another moment we account all progress as owing to man, to individual action, or to the concerted action of communities. Race-tides and world-tides overwhelm us with their force, and we deem ourselves helpless to make our destiny. We are in turn self-conceited in contemplation of our position, physical, social, intellectual, or industrial; and then again abashed by the fear of our neighbors' criticism. It is difficult to walk the *via media* between over-self-confidence and timidity.

Especially do self-complacency and pride of position, on the one hand, and fear of criticism and subserviency to other standards, on the other hand, mark the condition of dependent and isolated stages in the life of a community. Either attitude of mind too long continued tends to a perpetuation of the provincial or of the colonial spirit. The provincial spirit is one that is narrow and egotistic. It is isolated by physical conditions or by self-conceit. It generates its own standards out of its own petty environment

Its door is closed to the large life of the world. Its manners and morals, narrow and bigoted, are of its own begetting. It looks askance at the freer thoughts and ways of larger communities. Ideals are lacking. Progress is closed to the society that thus considers itself as completely self-sufficing, that makes institutions that stagnate through inbreeding, that sets standards of bigotry and exclusiveness, exists without vital literature and art, and bars its doors to communication with the universe of ideas.

The mark of the colonial spirit is its dependence upon the authority and standards of a natural or adoptive mother community. It seeks its authority from above. It measures its manners, its morals, its literature, and its institutions by their conformity with those of distant type. It imports its leaders, guardians, and censors. No latent health and no possibility of development and progress resides in a colonial community until it arrives at the point where it begins to assert its intellectual independence.

In order that a community may become a free participant in the world's intellectual culture, there must needs be a spirit of the place. There must be traditions, associations, ideals that are formed and grow with the growth of the people, that cluster about a community, giving it form and character, if that community is to make a mark in history, is to be a salvation unto itself, and a factor in the general progress. California has the physical features and geographical position that give it every advantage for the development of such a spirit.

Let us imagine that the Anglo-Saxon had come here three centuries ago, in some such numbers and with some such incentive and purpose as were represented in the settlers in Virginia or in New England. We should in that case now form part of a strongly individualized community. It would have grown up in comparative isolation. It would have been forced to depend on its own resources, physical, intellectual, social. It would have been forced to develop its own polity, its own views and purposes of life. The

material resources of the environment would necessarily have been exploited and made to minister to the needs of the community. A spirit of the place would have been born in these surroundings and have directed the destinies of the people. Can we imagine that we of to-day would not have been proud to have been born of such a self-developed, almost self-engendered community? Think of it—a Californian produced Anglo-Saxon race. Think of the strength of the nationality, of both the proud and affectionate sentiment of patriotism. Consider what might have been the education, the free religious atmosphere, the civic and social institutions, perchance a native art and a native literature—how sweet, how virile, how passionate—true to the instincts of nature and true to the soul of man. There would have been a spirit of the place, as pronounced perhaps as that of ancient Attica, or of the Lowlands of Scotland, or of Massachusetts. If we let our minds dwell on this thought, we may be led to lament our modern conditions and our late coming to these shores. We might well wish that our fore-fathers had settled here centuries ago, so that we should now be enjoying a distinctive civilization of our own. Is not the Massachusetts man or the Virginian rightly proud that his ancestors found their home in their respective localities long before his birth, and gave stamp and character and individuality to the community out of which he came, making him a Massachusetts man or a Virginian?

Or, to take another thought, how would it be now, if to-day the Anglo-Saxon were new-come upon the virgin soil of America; if these States were fresh settlements from England, no more than a half-century old? Why, we should be *only* Englishmen looking back to England for our copy and standards, reproached perchance by each new arrival from the mother-country for our crudity and uncouthness. And even as the New Yorker and Carolinian is proud of the heritage that is his, so are we all gratefully proud of our common American heritage. We are thankful

that form and coherence and homogeneity were given to the individual spots and corners of our common country, and to that whole division of the continent that is Anglo-American in speech and polity, before the advances of science, the facility of transportation, and the mighty cosmopolitanism of to-day threatened to obliterate all individuality of culture and to reduce us to one common indiscriminate level.

California is emerging from the colonial condition. We are in a state of unstable equilibrium. We feel instinctive promptings to move ahead on our own responsibility, and yet we fear that we are not good enough for ourselves, and that those in whose intellectual company we desire to be will ridicule us. The thought is entertained that a community is not emancipated until it can show an art and a literature and an industrial development of its own. But "life comes before literature," and the life in a colony produces no literature. We have no just ground for lamenting the lack of a literature, or of an art, if we have within ourselves the potentialities, and if we intend to foster the conditions that will ensure a literature and an art and all the manifestations of a good and sufficient life. But for such consummation, we need to recognize the dangers and guardfully prepare the way. California is destined to be the passage-ground of innumerable peaceful armies. Across and up and down they will come and go. Intercommunication, exporting and importing, railroads, telegraphs, newspapers, floods from the world's press, commerce, north, south, east, and with the island "paradises of the Pacific," incessant movement, traffic, stir—these will leave us no place to be isolated or provincial. But if we are content with accepting imported morals, manners, and letters, we may verily become an intellectual desert. The community cannot be self-reliant, virile, and ethical that copies, and imitates, and conforms. True, the wise community gathers all it can in ethics, æsthetics, science, and letters from the untold ages behind it and from all the

world around it. But it must have a mind and conscience of its own that will assimilate these and adjust them to its time, place, and destiny. The community no more than the man has moral strength that takes its pace from others. There must needs be born and cultivated within it a conscience of its own. All that it receives it must absorb into its very self, and again effuse as a new product.

That our modern life is largely institutional and social rather than personal makes the problem of our civilization in appearance perhaps somewhat different from that of other times. In fact, rather, it makes it more important to observe the conditions of success which have characterized older communities. Older communities have advanced to intellectual power and leadership as they have obeyed the principles we have indicated. Their progress has been in proportion both to their openness of mind and to the degree of their self-reliance. Their development has been in the proportion in which they have builded upon themselves through their own strength and purpose, and in which they have at the same time availed themselves of all external and foreign aids and agencies of culture. Now, in the modern institutional society, it becomes particularly important to preserve the purity and individuality of institutions. Institutions should have the character of the communities which they represent and minister to; they should be the very outgrowth of the life they are to subserve. The control and direction of them must be in the hands of those who understand them. They must be kept in harmony and sympathy with the uses and purposes for which they are devised. And they must, at the same time, be constantly liberalized in spirit and enlarged in scope by bringing to the work of their operation men of skill and power. Teachers, prophets, and sages from all lands must be heard from afar and from near.

How much, for instance, have we gained from the teachings, the influence, and even presence of the distinguished men, who within a few years have been brought, for brief intervals, to the State at the instance of the University

of California. To have seen and heard such men as Professor William James, Dr. Harris, and Professor Watson has been uplifting. And this convention, and all California, is feeling today the thrill of an expanding soul through the wise words and inspiring presence of our eminent guest, Dr. Stanley Hall.

California stands, then, at an exposed point in the march of mankind. It possesses the advantages and incurs the dangers incident to such a position. To preserve its purity and integrity, its own moral value, is no light task. To gather to its help all healthful influences, and to subordinate the vicious, requires all the tenacity of a fixed purpose. Above all things, to meet the continuing emergency of the problem, what we need is a moralized and educated population; a large contingent of men eminent in ability; and whole classes of statesmen, teachers, artisans, and laborers who are equal to the modern complex demands of their several professions. And we may reasonably, with the coöperation of all other institutions and agencies, lay the chief burden of responsibility for the fulfillment of this high behest of society upon the University and the other parts of the educational system.

THE ACCREDITING OF SECONDARY SCHOOLS.*

The plan of accrediting Secondary Schools gives expression to the close relation between them and the University in a matter of common concern. The University of California regards it as an important part of its public duty, to propose and encourage good standards in secondary education.

In its external or official aspect, the relation is one upon which each school enters voluntarily. But a certain constraint is exerted locally by the patrons of each school, to merit, and maintain unimpaired, the recognition of excellence implied in placing it upon the annual list. It has been kept steadily in view at the University, that such constraint to seek its endorsement will be a strong and healthful influence, in proportion as the standards of the University are high, and its judgments are impartial as well as intelligent. The committee to which is entrusted the sifting of all matters connected with the schools is large enough to represent every interest, and to secure reasonable balance in its recommendations.

The geography of California puts real difficulties in the way of comprehensive inspection of our high-schools. But the results already evident establish the value to the State of this contact between the University and the schools. The intention has been throughout to make the policy of

*This circular has been drawn up by the Schools Committee of the University. It is designed to give information which is frequently asked for, concerning the ideas underlying the Accrediting System, and the lines which the recommendation of the Committee follow.

the University flexible in its adjustment to the situation, rather than rigid; and to modify details of execution where the development of the plan has indicated that as desirable. If the essential purpose of the contact is held clearly in mind, further improvement in procedure may be relied upon to grow out of experience.

It is true that the plan operates to secure a permanent constituency for the University, of students prepared to enter upon its work. But the unswerving aim has been, so to shape the policy and the procedure under it, that beneficial influences might affect the entire school in every instance. The scope of the questions raised therefore includes the larger number of pupils whose education does not extend beyond the secondary stage, as well as the smaller number who finally attend the University. This conscious purpose has defined itself more clearly and strongly during the past ten years. And thus it has come to be regarded almost as an incidental matter, that recommended graduates of accredited schools are relieved (in whole or in part) from entrance-examinations at the University; though, of course, this privilege to be obtained for their graduates acts as one incitement to the schools to secure accrediting.

In its essence, and from the beginning, the plan has been conceived as one of coöperation. Broadly stated, the common motive and interest are, that California should develop a system of strong, progressive schools, in whose organization there may be realized to the full the fruits of modern international discussion upon questions of universal importance in education.

The University and the schools supplement each other. On the one hand a uniform, broadened judgment has been applied, whose general effect has been to revise local standards, and counteract the drawbacks of isolation. The schools, on the other hand, in the aggregate and individually, have presented the local conditions which may rightly modify in application the suggestions received from

experience elsewhere. There can be no doubt that a distinct benefit has accrued from the union of these elements, in that the pace for advancement has thus been set under regulation of any tendency to make undue requirements.

In this process of bringing about a just balance, the older and more fully-developed schools have naturally exercised the strongest positive influence. It may easily be foreseen that the experience gathered in well-established schools will be a factor of continually increasing weight in the consultations upon secondary education. To perceive this, we need but observe the course of events in other countries, where the principals of great secondary schools can speak with conceded authority within their own sphere.

The profession of teaching in this State now includes an increasing number of college graduates. They work under conditions improved in many respects, which render the calling more congenial, and lead to its permanent adoption. The accumulated result of intelligent study given to professional problems by such teachers will inevitably make its own way to recognition.

But the fuller introduction of these factors must be accompanied by heavier incidence of responsibility upon the schools. With more widespread knowledge of the data already yielded by experience, there will be less excuse for teachers or schools in repeating for themselves the long series of trials, errors, and corrections, by which good traditions have been built up. That is, principals and teachers may be expected to occupy intelligently the territory which is redeemed from debate and experiment.

The demands made upon a school before it is entered upon the accredited list may with propriety be greater now than they were ten years ago. In saying this, the thought is not so much that the requirement for matriculation at the University shows increase. Nor even that stricter interpretation in terms of actual standards may be given to the same printed statements. The grounds for the advance are seen rather in the fuller supply of qualified

teachers; the more widely-diffused acquaintance with standards in the several subjects; and the greater number of good models to imitate among the schools themselves.

On the other hand, too, University examiners will be fitted for the best exercise of their function, in proportion as they add in greater measure to their command of the subject-matter in their own departments, the further qualification of familiarity with the scope of elementary teaching, and the pedagogic problems presented in secondary education.

The present situation is in no respect a stationary one. The average school is expected to move steadily upwards towards the level already attained by the best. And the plan of annual supervision by the University may be maintained with profit, until its relaxation shall be justified by a general condition of excellence and stability among the high-schools of the State.

In California it has been thought best that strong emphasis should be laid upon securing systematic instruction, continued through the entire period covered by the high-school program, and made the best attainable at each stage. The results of examinations upon a single set of papers sent to the schools from any center are apt to be capricious and inconclusive, because the conditions are unavoidably artificial. Hence the University has with very distinct purpose departed altogether from the scheme of "Local Examinations" as developed in England, and followed by some institutions in this country.

The list of Accredited Schools published in the University REGISTER every year does indeed show the status of the class graduated from each school in that year. But it reaches this end by putting together the items of record gathered as the class has been under observation in the school from the first year to the last, and allowing credit for every piece of good work in every year. A premium is set upon sustained effort, and integrated result, as regards both school and pupils.

Questions are of course put to the pupils at the times when the school is visited, as an element in studying the teacher's method with his classes. But these are chiefly oral, and have for their object to ascertain the quality of the teaching, not to probe the knowledge of the pupils severally. In fact, the University does not intend to pass judgment upon individual graduates. But having approved the standards of the school, on the basis of visits by examiners, and consideration of the teaching, the course of study, and the attainment of the pupils, it leaves the principal to apply them, and accepts his recommendations without further question. There is here a consistent maintenance of the coöperative idea. The main concern of the University being to encourage a wide comparative view of the standards that may reasonably be reached in secondary schools, and to apply its own tests by annual inspection, to the schools as unified organizations.

The University has an indirect check upon the principal's exercise of his freedom in applying the standards to individuals. This is found in the performance of his recommended graduates who pass into the University. A close scrutiny of such data shows no general indication that the responsibility is too lightly regarded. In most cases, severer conditions are enforced by the school in recommending for entrance to the University than in granting its own diploma.

Because so great a weight is held to attach to the pupils' performance, term by term, it is important that the University endorsement should not rest upon a cursory view of the school at longer intervals; nor upon general impressions merely. Therefore the schools are regularly visited once a year, in order that the training of any given class may be followed step by step. And further, judgment is passed upon each branch of study by a member of the corresponding department at the University, in order that the opinion may be one deliberately given by an expert. It is believed that these features in the procedure are fundamental to the

real effectiveness of any system of accrediting. At least it is significant that California should be generally acknowledged as a field of great success in this work, while complaints of failure, and reproach of laxness, are freely directed against such systems where these fundamental features are not adopted.

By adhering as consistently as possible to these lines, and continuing to pursue these ends during a series of years, the University has endeavored to foster and strengthen every tendency towards excellence in the high-schools of California. Much has undoubtedly been done in the way of improving the schools already organized, and opening schools in new centers upon a sound basis. In certain departments of school-work, California has not followed the older states, but has led the advance.

The outcome of this stimulated activity is apparent in the long list of "Accredited Schools." They are recommended to public approval as offering well-arranged courses of study in the essential subjects of good secondary education; as being officered by an adequate staff of competent teachers; and as proving the good quality of their instruction by the attainments of their graduates.

In the exercise of the University's function as judge, there are cases presented every year, in which the approval implied in accrediting is withheld for what seems good cause. While the reasons determining the lines upon which decision is based may find general explanation in what has already been said, it remains to indicate several types which frequently occur, of deficiency that must be removed before a school is accredited.

First, where the number of teachers is insufficient to provide properly for the necessary instruction. For example, the University has declined to accredit high-schools where there is one teacher only. Such schools are still found in remoter and more sparsely-settled districts; and full justice should be done them as centers of good influence for their communities; but they can not be accepted

as covering the ground of secondary education to the extent required.

If the circumstances are favorable, a high-school with two teachers may be accredited. But the inclination is to regard three teachers as a normal minimum, towards which even the smaller schools should strive, so soon as the local conditions permit.

Where the number of teachers is too small, the dilemma to be faced is that either the course of study must be curtailed, or the school-periods must be made too short for due exposition of the subject, and impression upon the pupil. Only in part can these difficulties be offset by a possible concentration of effort upon smaller classes. Further, the high-school has now reached a stage where the daily preparation for presenting a large number of subjects properly is a task of such magnitude that few could accomplish it.

The teaching is inevitably depressed in qualities of illustrative resource by these conditions, and is apt to degenerate into "hearing of lessons." This remains true, even granting the unusual combination that there is positive attainment in all the branches, to the degree which qualifies for teaching them. As a matter of normal requirement, again, a teacher should not have more than five periods a day to prepare for.

Secondly, where the teaching is for other causes not satisfactory. The main elements here to be considered are two: Scholarship and Method. The former needs no discussion; it is the first interest of every community that the teachers it engages be competent in their knowledge of the subjects which they profess to teach. The University is doing good service wherever it renders evident any lack in this respect that may exist. And an expert examiner is very likely to locate this form of weakness.

As regards method there is need for real discretion and discrimination. A danger that affects all schemes of inspection is that of cramping the teacher's essential freedom in

presenting his subject to suit his individual views, and shaping his manner of treatment accordingly. A flexibility of judgment must be preserved in the examiner, in order that his mind may be left open to perceive excellence in any guise. Within the limits thus expressed, the teacher's personal right must be respected, as furnishing the vital condition of progress in our schools. Without infringing upon this region, however, method may be characterized as faulty, for the reason that it is universally rejected by sound pedagogic opinion, or is lacking in force, system, and disciplinary value. Such defects as these will always affect results, and may be made the ground for rating work as unsatisfactory.

Thirdly, where the course of study is not well arranged. Some schools show a more or less complete survival of the older state of affairs, in which fragmentary treatment of many subjects was proposed as a high-school course. Unanimous opinion in educational circles has condemned this as an evil; and as a mistaken policy, even where intended to meet diversified local needs. There is no local need in education which ought to be allowed to supersede thoroughness in fundamental branches.

But ambition may be ill-directed, along lines somewhat different from this. If the course of study contains the fundamentals fairly represented, results may still fail to attain a reasonable standard, because alternative subjects have also been included, to a degree that is out of proportion to the teaching-force. It must be remembered that no course of study can be adapted to all schools, irrespective of particular considerations. The field that may properly be covered by it depends upon the number and the special preparation of the teachers. But it is no uncommon experience to find two teachers in a struggling school, who could very likely do acceptable work if they confined themselves to bare essentials, frittering effort upon extra subjects, to the frustration of their own best purposes. The advice given, without exception, by the University, is

to attempt what can be done with thoroughness, and no more. And effect being given to that advice, by a clear refusal to accept any substitute for this primary requisite, the position of teachers in resistance to exorbitant claims made upon them has often been fortified advantageously against mistaken local tendencies. There is inexorable logic in these matters. In order to be elaborate and complete in its range of work, a high-school must have a staff of teachers to correspond. If the state of the available funds forbids this, it is wisdom to prune the course of study to the quick, in preference to assigning many subjects to few teachers, and thus diluting their effectiveness.

While speaking of the course of study, it is appropriate to say that the University applies no inflexible rule concerning the time over which it must extend. Schools are still showing acceptable performance in three years, although this is done with such increasing difficulty that their number is falling off annually by natural process. The largely predominant majority have moved in the direction of lengthening the course to four years. It is already fair to say that the normal high-school in California devotes three entire years to its task; and half the pupil's time during a fourth year to subjects like English, Mathematics, and Latin. There is little doubt that, before the end of the next five years, the three-year course will be met with in high-schools as a rare exception. So soon as the situation justifies the action, the program which allots three and one-half years to the high-school will be insisted upon. Meanwhile school-authorities should be aware that rigid economy of time and liberal expenditure of effort are needed, if the accomplishment of work that is satisfactory in quality and extent as a high-school course, according to standards now prevailing, is to be made possible within the limit of three years. Dissipation upon scattering alternatives will very probably lead to failure. Success is obtainable only by following the best models for sequence of studies and arrangement of material. So much depends

here upon the efficiency of teachers, and the tone of the school as encouraging industry in its pupils, that each case arising must be judged on its merits.

Fourthly, where radical changes have been made, affecting the staff of teachers and the course of study. The reason for denying the request to accredit is plain, if such changes are to the detriment of the school. But supposing that they bring decided improvement, accrediting is not necessarily earned in the first year after they go into operation. The idea has been insisted upon above, that a vital point to be attained is a certain duration of good training. Impressions must have been persistently deepened, if their effects are to abide. Satisfactory work in the final year alone is not a sufficient guarantee of the fruit which the high-school period should bear. Weak organization and incompetent teaching have in this sense injurious results which continue after the defects have been remedied. The action of the University emphasizes this view, when the accrediting of a school is postponed until such time as its graduates are found to have had competent instruction throughout the course.

This remark finds application in the case of newly-organized schools. Acceptance is precluded until the first graduating-class can be offered as a product of the influences which the school exerts. It is also offered in explanation of the fact that other and older schools have been declared unripe for accrediting, although the instruction given during the year in question was acknowledged to be of good grade, when improvements were of too recent date to have moulded the graduates of that year.

Finally, a word may be said in response to a question frequently asked: "What number of subjects (if reported favorably) constitute a minimum for granting accrediting to a school?" This question, and others of similar purport, can not be answered in general terms. First, it is dangerous to formulate a minimum, lest it find acceptance as a normal standard. But the more central thought is,

that the determining factor is not the number of subjects alone, but their grouping, and their importance when taken singly. A secondary school is not in full enough performance of its function to justify accrediting, which makes a weak showing in language and history, while it favors mathematics and science; or conversely. But a school may deserve recognition for making praiseworthy beginnings, which does fundamental work on all main lines well, although the tests for advanced work have not yet been completely satisfied. The University might then express contrary judgments upon the applications of two schools for accrediting, although the same number of courses were reported upon favorably in each case.

The questions that the Schools Committee is called upon to decide, before making its recommendations, can not all be settled according to rules fixed and printed beforehand. There is no criterion of excellence that is capable of mechanical application. A good building, a wisely-framed course of study, and well-trained teachers, may have been brought together. But the presumptions thus raised are set at naught, if it be found that the ambition of pupils is actually not kindled, and their power to work is not developed. In order to be voted satisfactory, a test applied to the school must have shown that the external impressions are corroborated by results in the pupils.

The issues here presented, involving such elements as morale, lines of organization, adjustment of work, are perhaps the most grave that the University has to face in this field of activity. A residue of personal responsibility must remain, in passing judgment where some elements affecting decision are subtle—though real. This responsibility can be met with confidence, however, when a basis of thorough and fair consideration for all essential factors supports the decisions which are reached.

